

Listing of Claims

1-39 (Cancelled).

40. (New) A recombinant nucleic acid molecule comprising a heterologous polynucleotide selected from the group consisting of:

- (a) a nucleic acid coding sequence having at least 95% sequence identity to the *Arabidopsis KCS2* coding sequence shown at position 1046-2509 of SEQ ID NO: 1, when optimally aligned, wherein the sequence encodes a plant very long chain fatty acid condensing enzyme that catalyses condensation of malonyl-CoA with a C16, C18, C20, or C22 acyl-CoA; and
- (b) a complementary nucleic acid sequence fully complementary to the nucleic acid sequence of (a).

41. (New) The recombinant nucleic acid molecule of claim 40 wherein the nucleic acid coding sequence is the *Arabidopsis KCS2* coding sequence shown at position 1046-2509 of SEQ ID NO: 1.

42. (New) The recombinant nucleic acid molecule of claim 40 wherein the nucleic acid coding sequence hybridizes under stringent conditions to the complement of the *Arabidopsis KCS2* coding sequence shown at position 1046-2509 of SEQ ID NO: 1.

43. (New) A transgenic plant comprising the recombinant nucleic acid molecule of claim 40.

44. (New) A part of a transgenic plant comprising the recombinant nucleic acid molecule of claim 40.

45. (New) The transgenic plant of claim 43, wherein the transgenic plant has a modified phenotype compared to a non-transgenic plant of the same species.

46. (New) The transgenic plant of claim 43, wherein the plant is a monocot.
47. (New) The transgenic plant of claim 43, wherein the plant is a dicot.
48. (New) The transgenic plant of claim 43, wherein the plant is a species of one of the *Cruciferae* family, *Composirae* family, *Palmae* family, or *Leguminosae* family.
49. (New) The transgenic plant of claim 43, wherein the plant is selected from the group consisting of: canola, rapeseed (*Brassica* spp.), crambe (*Crambe* spp.), honesty (*Lunaria* spp.) lesquerella (*Lesquerela* spp.), sunflower (*Helianthus* spp.), safflower (*Carthamus* spp.), niger (*Guizotia* spp.), palm (*Elaeis* spp.), coconut (*Cocos* spp.), peanut (*rachis* spp.), soybean (*Glycine* spp.), (*Zea* spp.), cotton (*Gossypium* sp.), jojoba (*Simonasia* sp.), flax (*Linum* sp.), sesame (*Sesamum* spp.), castor bean (*Ricinus* spp.), olive (*Olea* spp.), poppy (*Papaver* spp.), spurge (*Euphorbia* spp.), meadowfoam (*Limnanthes* spp.), mustard (*Sinapis* spp.) and cuphea (*Cuphea* spp.).
50. (New) A transgenic seed comprising the recombinant nucleic acid molecule of claim 40.
51. (New) The transgenic seed of claim 50, wherein the seed is for a plant of the species of one of the *Cruciferae* family, *Composirae* family, *Palmae* family, or *Leguminosae* family.
52. (New) The transgenic seed of claim 50, wherein the seed is for a plant selected from the group consisting of: canola, rapeseed (*Brassica* spp.), crambe (*Crambe* spp.), honesty (*Lunaria* spp.) lesquerella (*Lesquerela* spp.), sunflower (*Helianthus* spp.), safflower (*Carthamus* spp.), niger (*Guizotia* spp.), palm (*Elaeis* spp.), coconut (*Cocos* spp.), peanut (*rachis* spp.), soybean (*Glycine* spp.), (*Zea* spp.), cotton (*Gossypium* sp.), jojoba (*Simonasia* sp.), flax (*Linum* sp.), sesame (*Sesamum* spp.), castor bean (*Ricinus* spp.), olive (*Olea* spp.), poppy (*Papaver* spp.), spurge (*Euphorbia* spp.), meadowfoam (*Limnanthes* spp.), mustard (*Sinapis* spp.) and cuphea (*Cuphea* spp.).

53. (New) A transgenic cell comprising the recombinant nucleic acid of claim 40.
54. (New) The transgenic cell of claim 53, wherein the cell is a non-human cell.
55. (New) The transgenic cell of claim 53, wherein the cell is a plant cell.
56. (New) A recombinant expression vector comprising the recombinant nucleic acid molecule of claim 40.
57. (New) A recombinant expression cassette comprising the recombinant nucleic acid molecule of claim 40 operably linked to a promoter.
58. (New) An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:
- (a) a nucleic acid coding sequence having at least 95% sequence identity to the *Arabidopsis KCS2* coding sequence shown at position 1046-2509 of SEQ ID NO: 1, when optimally aligned, wherein the sequence encodes a plant very long chain fatty acid condensing enzyme that catalyses condensation of malonyl-CoA with a C16, C18, C20, or C22 acyl-CoA; and
 - (b) a complementary nucleic acid sequence fully complementary to the nucleic acid sequence of (a).
59. (New) The isolated nucleic acid molecule of claim 58 wherein the nucleic acid coding sequence is the *Arabidopsis KCS2* coding sequence shown at position 1046-2509 of SEQ ID NO: 1.
60. (New) The isolated nucleic acid molecule of claim 58 wherein the nucleic acid coding sequence hybridizes under stringent conditions to the complement of the *Arabidopsis KCS2* coding sequence shown at position 1046-2509 of SEQ ID NO: 1.

61. (New) A method of producing a transgenic plant, the method comprising introducing into the plant the isolated nucleic acid molecule of claim 58.
62. (New) A progeny plant produced by sexual or asexual propagation of the transgenic plant produced by the method of claim 61 or produced by propagation of the progeny plant, wherein the progeny plant comprises the nucleic acid molecule.
63. (New) A transgenic plant comprising the isolated nucleic acid molecule of claim 58.
64. (New) A part of a transgenic plant comprising the isolated nucleic acid molecule of claim 58.
65. (New) The transgenic plant of claim 63, wherein the transgenic plant has a modified phenotype compared to a non-transgenic plant of the same species.
66. (New) The transgenic plant of claim 65, wherein the plant is a monocot.
67. (New) The transgenic plant of claim 65, wherein the plant is a dicot.
68. (New) The transgenic plant of claim 65, wherein the plant is a species of one of the *Cruciferae* family, *Compositae* family, *Palmae* family, or *Leguminosae* family.
69. (New) The transgenic plant of claim 65, wherein the plant is selected from the group consisting of: canola, rapeseed (*Brassica* spp.), crambe (*Crambe* spp.), honesty (*Lunaria* spp.), lesquerella (*Lesquerella* spp.), sunflower (*Helianthus* spp.), safflower (*Carthamus* spp.), niger (*Guizotia* spp.), palm (*Elaeis* spp.), coconut (*Cocos* spp.), peanut (*Arachis* spp.), soybean (*Glycine* spp.), (*Zea* spp.), cotton (*Gossypium* sp.), jojoba (*Simonsia* sp.), flax (*Linum* sp.), sesame (*Sesamum* spp.), castor bean (*Ricinus* spp.), olive (*Olea* spp.), poppy (*Papaver* spp.), spurge (*Euphorbia* spp.), meadowfoam (*Limnanthes* spp.), mustard (*Sinapis* spp.) and cuphea (*Cuphea* spp.).

70. (New) A transgenic seed comprising the isolated nucleic acid molecule of claim 58.

71. (New) The transgenic seed of claim 70, wherein the seed is for a plant of a species of one of the *Cruciferae* family, *Composirae* family, *Palmae* family, or *Leguminosae* family.

72. (New) The transgenic seed of claim 70, wherein the seed is for a plant selected from the group consisting of: canola, rapeseed (*Brassica* spp.), crambe (*Crambe* spp.), honesty (*Lunaria* spp.) lesquerella (*Lesquerela* spp.), sunflower (*Helianthus* spp.), safflower (*Carthamus* spp.), niger (*Guizotia* spp.), palm (*Elaeis* spp.), coconut (*Cocos* spp.), peanut (*rachis* spp.), soybean (*Glycine* spp.), (*Zea* spp.), cotton (*Gossypium* sp.), jojoba (*Simonasia* sp.), flax (*Linum* sp.), sesame (*Sesamum* spp.), castor bean (*Ricinus* spp.), olive (*Olea* spp.), poppy (*Papaver* spp.), spurge (*Euphorbia* spp.), meadowfoam (*Limnanthes* spp.), mustard (*Sinapis* spp.) and cuphea (*Cuphea* spp.).

73. (New) A transgenic cell comprising the isolated nucleic acid molecule of claim 58.

74. (New) The transgenic cell of claim 73, wherein the cell is a non-human cell.

75. (New) The transgenic cell of claim 73, wherein the cell is a plant cell.

76. (New) A recombinant expression vector comprising the isolated nucleic acid molecule of claim 58.

77. (New) A recombinant expression cassette comprising the isolated nucleic acid molecule of claim 58 operably linked to a promoter.